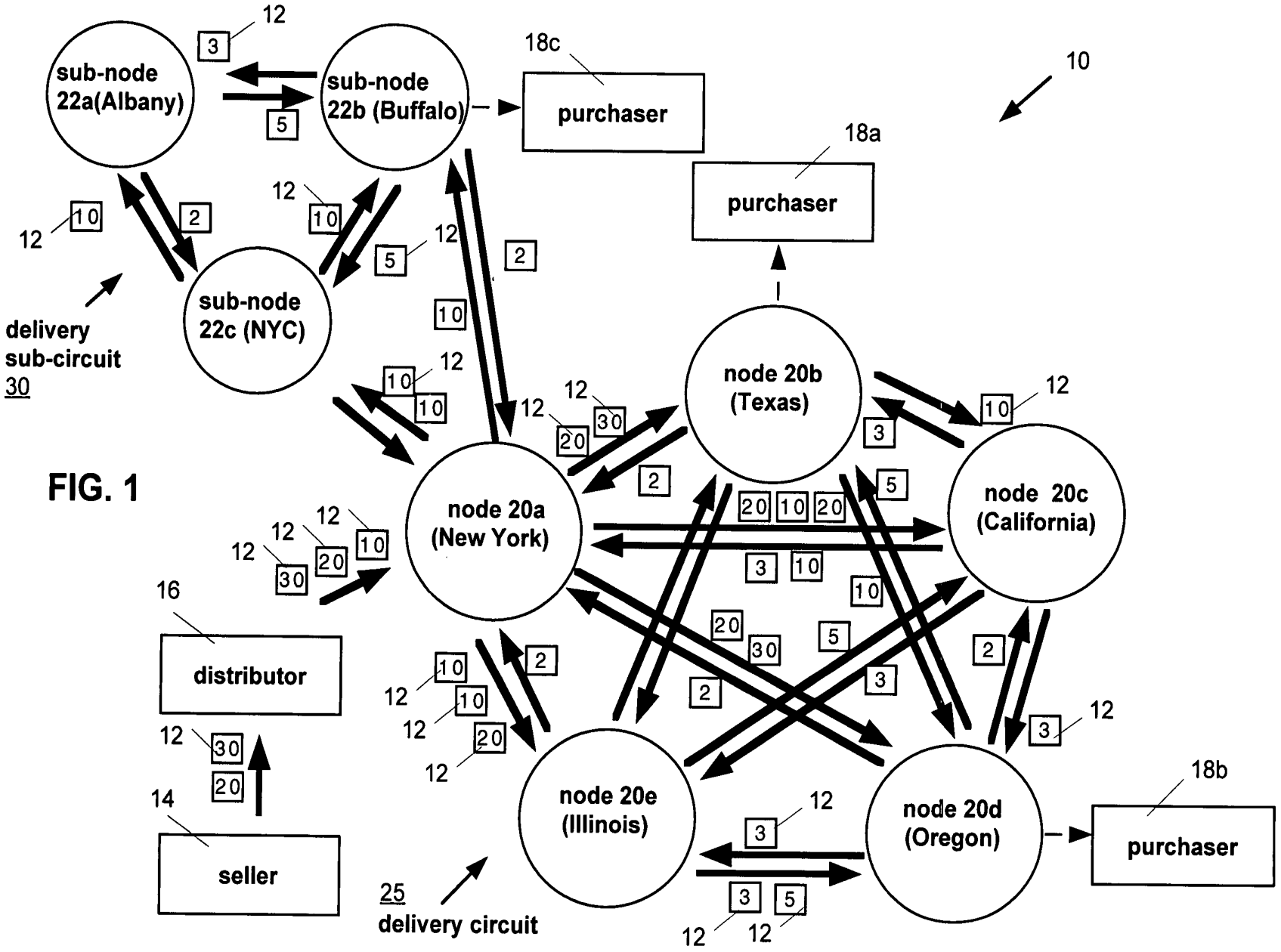
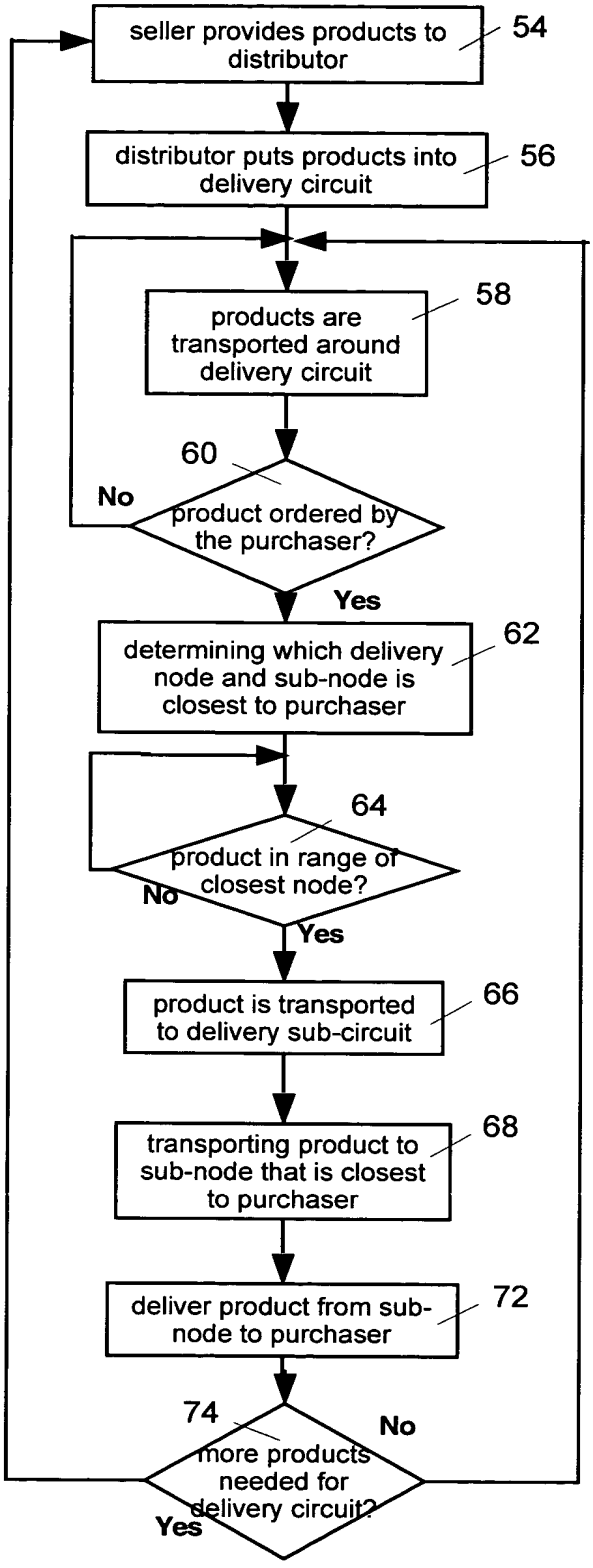

sub-node 22a(Albany)
sub-node 22b (Buffalo)
sub-node 22c (NYC)
purchaser
18c
purchaser
18a
10
delivery sub-circuit 30
node 20a (New York)
node 20b (Texas)
node 20c (California)
node 20d (Oregon)
node 20e (Illinois)
distributor
16
seller
14
25
delivery circuit
purchaser
18b
12

FIG. 1


seller provides products to distributor
54
distributor puts products into delivery circuit
56
products are transported around delivery circuit
58
60
No
product ordered by the purchaser?
Yes
determining which delivery node and sub-node is closest to purchaser
62
64
product in range of closest node?
No
Yes
product is transported to delivery sub-circuit
66
transporting product to sub-node that is closest to purchaser
68
deliver product from sub-node to purchaser
72
74
No
more products needed for delivery circuit?
Yes

50

FIG. 2

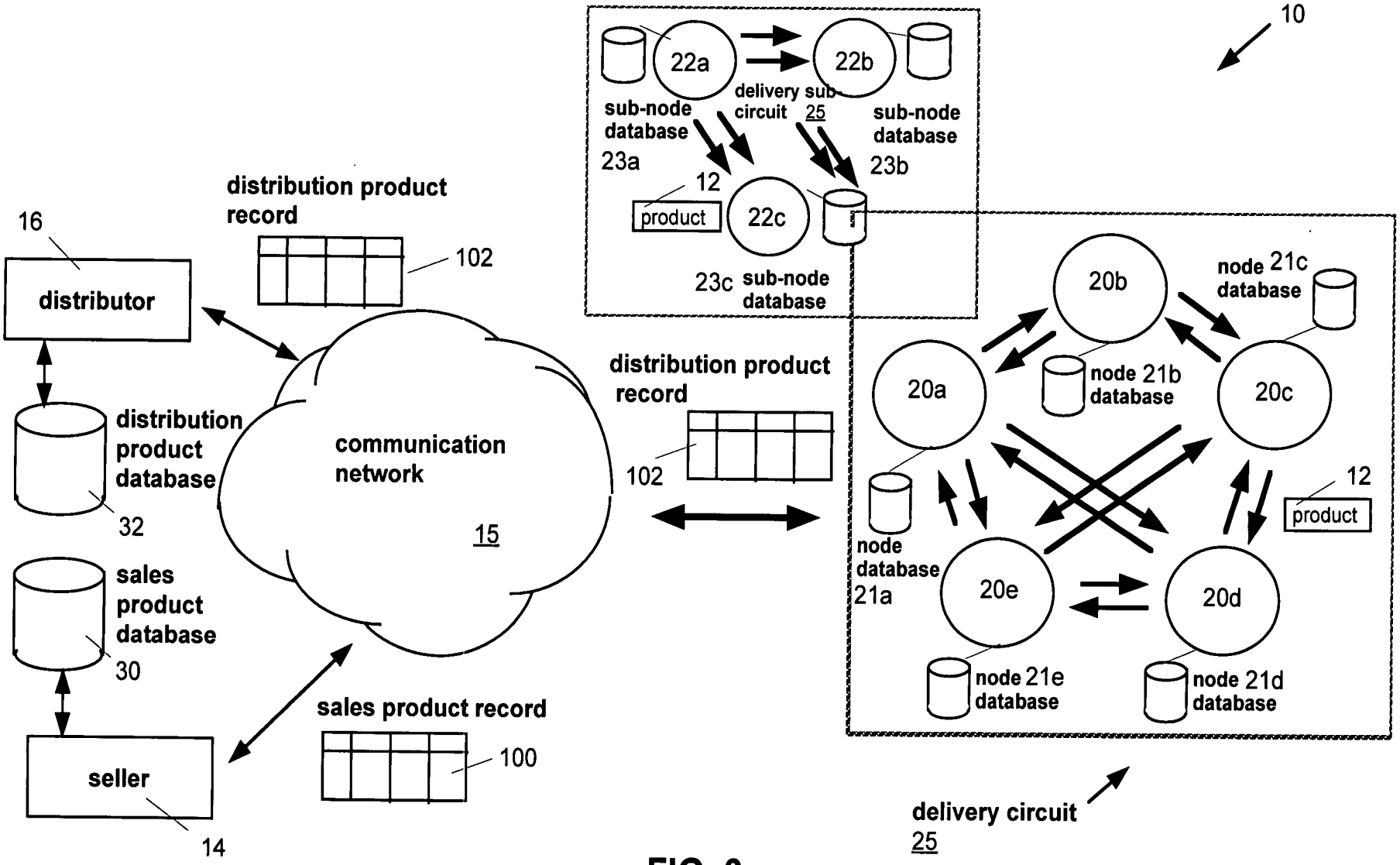
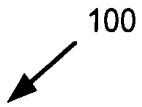

10
22a
22b
delivery sub-circuit 25
sub-node database 23a
sub-node database 23b
12
product
22c
23c sub-node database
distribution product record
102
16
distributor
distribution product database
32
communication network
15
sales product database
30
seller
14
sales product record
100
distribution product record
102
20a
20b
20c
20d
20e
node 21b database
node 21c database
node database 21a
node 21e database
node 21d database
12
product
delivery circuit
25

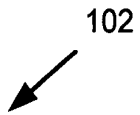
FIG. 3



sales product table

UTN	Tracking No.	SKU	Trans Type	Destination Node	Default Destination Node	Sold?	Sold Node	Final Destination Address	Date of Entry	Anticipated Arival Time	Last Updated
42-456	57346	doll	train	NYC (node 22c)	New York (node 20a)	YES	22c	123 Street, NYC, NY	05/01/03	May 30/03 10:00PM	2003/05/03
23-543	25236	doll	train	Buffalo (node 22b)	New York (node 20a)	YES	22b	456 Street, Buffalo, NY	05/01/03	May 31/03 10:00PM	2003/05/03
33-224	45744	doll	train	Dallas (node 24a)	Texas (node 20b)	NO			05/01/03	June 2/03 9:00AM	2003/05/02
34-352	23425	doll	train	Austin (node 24b)	Texas (node 20b)	NO			05/01/03	June 2/03 5:00PM	2003/05/02
25-342	23648	doll	train	Chicago (node 28a)	Illinois (node 20d)	NO			05/01/03	May 31/03 10:00PM	2003/05/02
23-552	57323	doll	train	Peoria (node 28b)	Illinois (node 20d)	NO			05/01/03	June 1/03 10:00AM	2003/05/02

FIG. 4A



distribution product table

Seller ID	UTN	Container ID	Trans Type	Destination Node	Default Destination Node	Sold	Sold Node	Anticip. Arrival Time at Dest. Node	Final Dest Address	Date of Entry	Deliv'd	Special Delivery Instr.
60489	42-456	505	train	NYC (node 22c)	NYC (node 22a)	YES	22c	May 30/03 10:00PM	123 Street, NYC, NY	05/01/03	NO	
41628	23-543	454	train	Buffalo (node 22b)	Buffalo (node 22b)	YES	22b	May 31/03 10:00PM	456 Street, Buffalo, NY	05/01/03	NO	
90531	54-234	862	train	New York (node 20a)	Texas (node 20b)	NO		June 1/03 10:00PM		05/01/03		

FIG. 4B

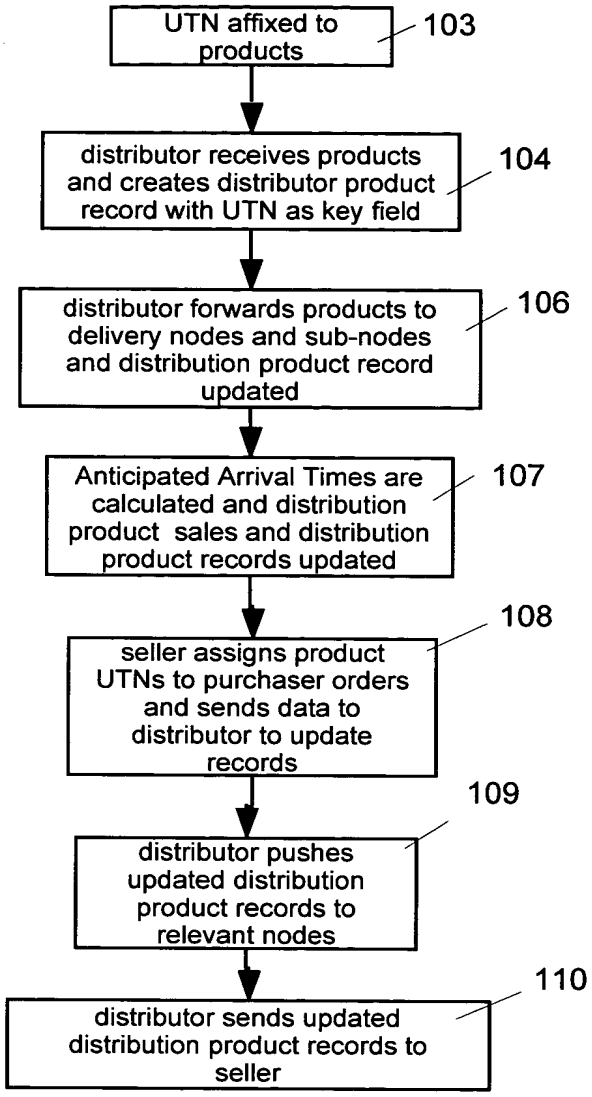

UTN affixed to products
103
105
distributor receives products and creates distributor product record with UTN as key field
104
distributor forwards products to delivery nodes and sub-nodes and distribution product record updated
106
Anticipated Arrival Times are calculated and distribution product sales and distribution product records updated
107
seller assigns product UTNs to purchaser orders and sends data to distributor to update records
108
distributor pushes updated distribution product records to relevant nodes
109
distributor sends updated distribution product records to seller
110

FIG. 5A

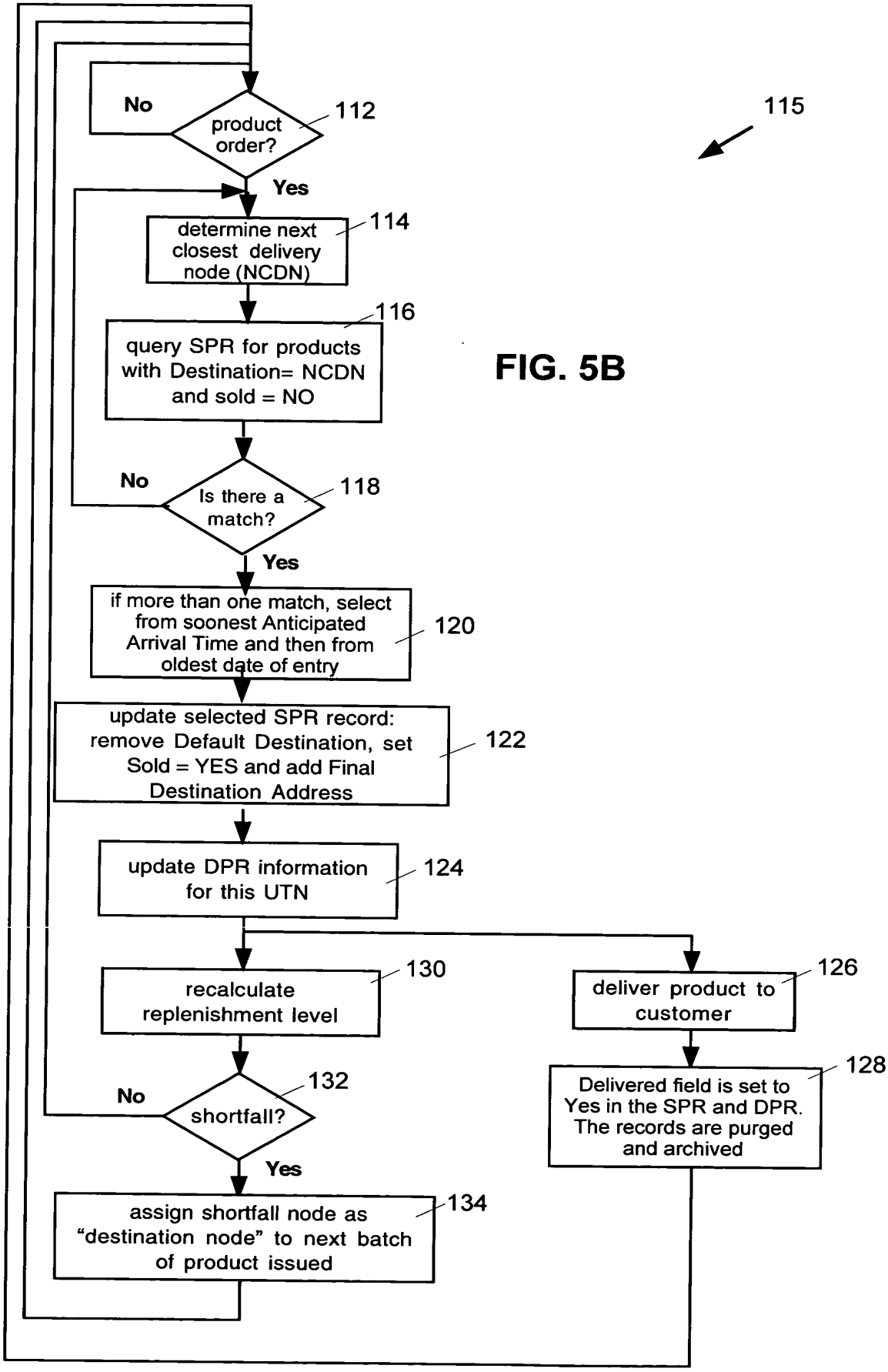

No
product order?
112
115
Yes
determine next closest delivery node (NCDN)
114
query SPR for products with Destination= NCDN and sold = NO
116
No
Is there a match?
118
Yes
if more than one match, select from soonest Anticipated Arrival Time and then from oldest date of entry
120
update selected SPR record: remove Default Destination, set Sold = YES and add Final Destination Address
122
update DPR information for this UTN
124
recalculate replenishment level
130
deliver product to customer
126
No
shortfall?
132
Delivered field is set to Yes in the SPR and DPR. The records are purged and archived
128
Yes
assign shortfall node as "destination node" to next batch of product issued
134

FIG. 5B

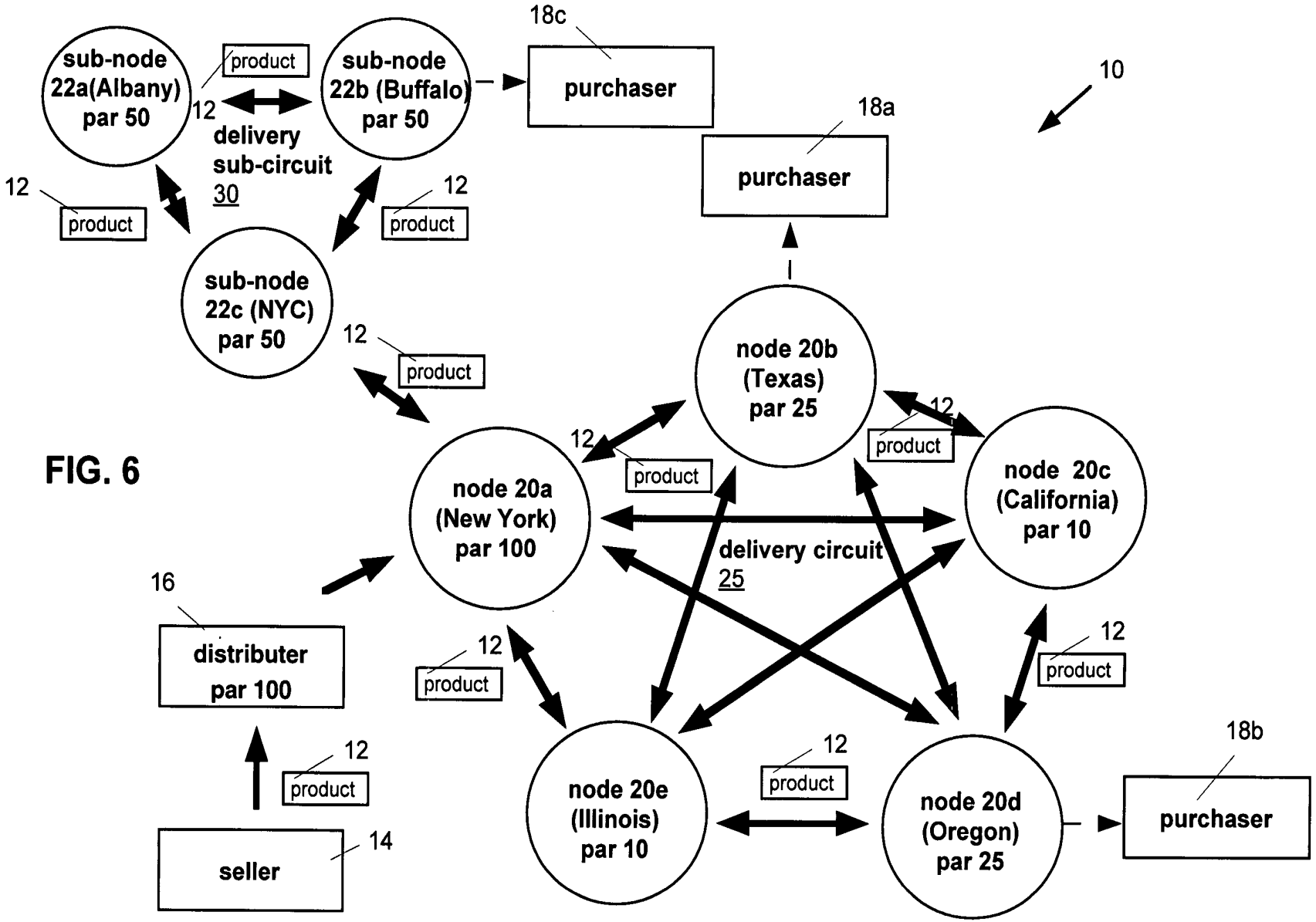

sub-node 22a(Albany) par 50
product
sub-node 22b (Buffalo) par 50
18c
purchaser
10
12
delivery sub-circuit 30
18a
purchaser
12
product
12
product
sub-node 22c (NYC) par 50
12
product
node 20b (Texas) par 25
12
product
12
product
node 20a (New York) par 100
node 20c (California) par 10
delivery circuit 25
16
distributer par 100
12
product
12
product
12
product
12
product
node 20e (Illinois) par 10
node 20d (Oregon) par 25
18b
purchaser
seller
14

FIG. 6

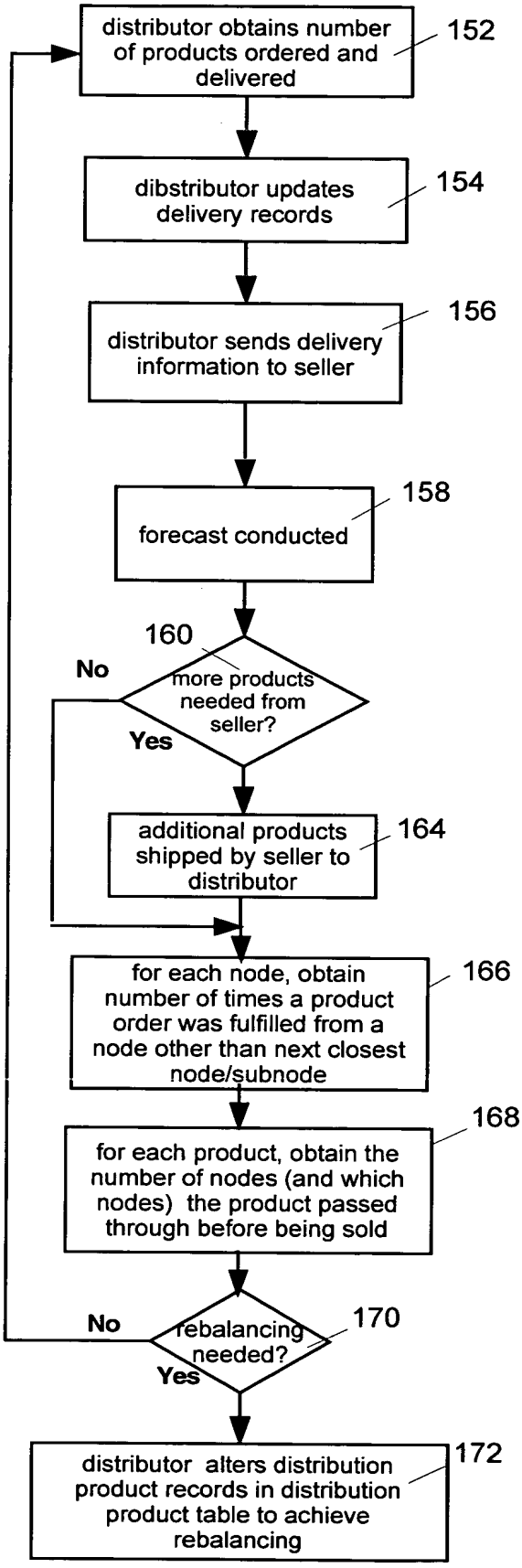

distributor obtains number of products ordered and delivered
152
150
dibstributor updates delivery records
154
distributor sends delivery information to seller
156
forecast conducted
158
160
more products needed from seller?
No
Yes
additional products shipped by seller to distributor
164
for each node, obtain number of times a product order was fulfilled from a node other than next closest node/subnode
166
for each product, obtain the number of nodes (and which nodes) the product passed through before being sold
168
rebalancing needed?
No
Yes
170
distributor alters distribution product records in distribution product table to achieve rebalancing
172

FIG. 7